

JOB CLASSIFICATION AND QUALIFICATION
GUIDELINES FOR CONTRACTOR PERSONNEL

OPERATIONS MANAGER

- (a) The following guidelines typify the background of personnel filling this position:

General background experience of the Operations Manager should include responsibilities in: recruiting and employee relations; interviewing and hiring of new employees; termination of employees; establishing and maintaining various reports/files/databases such as: resumes and Contract summaries, etc.; analyzing and negotiating facilities/equipment/other leases and managing office moves. Management background must include: development and implementation of Corporate policies; preparation of plans, schedules and coordination of all phases of difficult and complex tasks from start to finish; experience with Contract deliverables/financial tracking/close-out of Contracts. Technical background must include responsibilities in one or more of the following technical disciplines with a preferred general understanding of environmental requirements: reliability/maintainability; dynamics; thermal/climatics; EMC; natural space environments.

- (b) General Qualifications

- (1) Bachelor degree in Engineering or Physics; minimum of 15 years experience in Engineering and Technical Management with at least 5 years management experience.
- (2) Excellent written and oral communication and analytical skills.
- (3) Knowledge in applicable state/federal employment and Occupational Safety and Health Administration (OSHA) regulations/laws.
- (4) Knowledge in all company policies/procedures.

[Remainder of Page Left Intentionally Blank]

(c) Typical duties

Manage the JPL Contract for (the Subcontractor). This person will coordinate all JPL associated activities with the JPL Contract Technical Manager, JPL Technical Group Supervisors, and the JPL Subcontract Manager as required. Duties will include but not be limited to the following:

1. Coordinating staffing efforts: recruiting, interviewing, hiring, and termination of employees. Resolving personal issues.
2. Coordinating technical efforts with the JPL Technical Group Supervisors. Attend Reliability Engineering Office and group meetings as appropriate.
3. Providing liaison with the JPL Contract Technical Manager and/or the Reliability Engineering Office Manager as appropriate.
4. Establishing and maintaining various reports, files, databases.
5. Managing the facility and overseeing all operations.
6. Oversight of (Subcontractor) timekeeping.
7. Monitoring (Subcontractor) personnel.
8. Providing budgetary estimates as appropriate.
9. Various miscellaneous JPL requests for information.

[Remainder of Page Left Intentionally Blank]

**JOB CLASSIFICATION AND QUALIFICATION
GUIDELINES FOR CONTRACTOR PERSONNEL**

SENIOR ENGINEER II

- (a) The following guidelines typify the background of personnel filling this position:

The general background experience of a Senior Engineer II should include technical skills and responsibilities in: interpreting, organizing, and implementing complex, highly technical, state-of-the-art tasks; making decisions and recommendations that are recognized as authoritative and have a positive significant impact on various tasks/activities; being a recognized leader and authority in the company in a broad area of specialization or in a narrow but intensely specialized field; interfacing regularly at various levels, keeping management informed of task status, discussing newly proposed tasks, and making required presentations; identifying and assigning priorities for task accomplishment and ensuring that efforts meet established requirements, time schedules and budgets and that work meets all established standards for quality.

- (b) Specific requirements for the category of Senior Engineer II will be called out in each Subcontract Work Order (SWO), and will as a minimum include one of the following disciplines:

Reliability/Availability/Maintainability (RAM)

Must, as a minimum, have a Bachelor of Science degree with equivalent course work in Electrical or Electronic Engineering, Physics, or an equivalent field, and at least 15 years experience in electronic systems Reliability/Availability/Maintainability or logistics support to RAM activities. Experience must include system and subsystem digital, analog, or RF design and analysis, such as Probability Risk Assessment (PRA), Failure Modes, Effects and Criticality Analysis (FMECA), Fault Tree Analysis (FTA), reliability assessment, modeling, allocation, prediction trade-off studies, system evaluations.

Typical duties: Prepare product reliability plans, establish requirements for and monitor reliability programs; develop reliability trade-off studies; perform or review reliability analyses; assess performance with respect to requirements; evaluate effectiveness of the failure reporting, analysis, and corrective action implementation; prepare reports; support logistic activities and reporting; support system and design teams; establish reliability models and utilize models for systems and subsystems analysis; use of computer aided engineering tools.

Reliability Engineering Analyst (REA)

Must, as a minimum, have a Bachelor of Science degree with equivalent course work in Electrical or Electronic Engineering, Physics, or an equivalent field, and at least 15 years experience in electronic systems reliability activities. Experience must include digital, analog, or RF design and analysis, such as Failure Modes, Effects and Criticality Analysis (FMECA), Worst Case Analysis (WCA), Electronic Parts Stress Analysis (PSA), reliability assessment, modeling, prediction trade off studies, system evaluations; failure reporting, analysis, and corrective action; use of computer aided engineering tools.

Typical duties: Prepare product reliability plans, establish requirements for and monitor reliability programs; develop reliability trade-off studies; perform or review reliability analyses; assess performance with respect to requirements; evaluate effectiveness of the failure reporting, analysis, and corrective action implementation; prepare reports; support logistic activities and reporting; support system and design teams; establish reliability models and utilize models for systems and subsystems analysis.

Dynamics

Must, as a minimum, have a Bachelor of Science degree in Mechanical or Aeronautical Engineering and 15 years experience in dynamic environmental requirements and specifications. Ability to work system tasks and communicate with multiple interfaces is required. Dynamic Environmental testing, computer programming and dynamic analysis experience is desired.

Typical duties: Determine and specify vibration, acoustic, shock and climatic environments and design test criteria for flight projects and ground systems-both system and subsystem levels. Monitor dynamics tests and evaluate test results and data. Interface with other Contractors and JPL test programmers.

Thermal

Must, as a minimum, have a Bachelor of Science degree in Mechanical Engineering, Aeronautical Engineering or Physics. Must have at least 15 years of experience in thermal/climatic environment specification and testing and related disciplines. Must have some background in applicable military specifications related to environments and some capability in thermal design and analysis software such as Thermal Synthesizer System (TSS), Thermal Desktop including Fluint, Thermal Analyzer System (TAS), and Systems Improved Numerical Differential Analyzer (SINDA) or equivalent. Must have some background in reliability engineering.

Typical duties: Determine and specify thermal climatic environments and design and test criteria for spacecraft and ground electronics programs. Monitor thermal/climatic tests and evaluate results in terms of relevant reliability issues. Perform some thermal analyses and/or design review. Evaluate effectiveness of reliability testing programs. Participate in technical proposal generation. Interact extensively with project personnel.

Natural Space

Must, as a minimum, have a Bachelor of Science degree in Physics, with a minimum of 15 years experience. Prefer a Doctorate degree in Physics and at least 5 years experience in Space Environments Modeling. Computer programming experience is desired and ability to work system level tasks with good communication skills and multiple interfaces is required.

Typical duties: Determine and specify space environments and design and test criteria for both NASA and Military flight projects and ground systems - both system and subsystem level. Develop computer models of hardware cognizant engineers and test engineers.

EMC

Must, as a minimum, have a Bachelor of Science in Electrical Engineering or equivalent and at least 15 years experience related to Electro-Magnetic Compatibility (EMC) environment specification and testing. Must be thoroughly familiar with EMC engineering standards, test methods and certification.

Typical duties: Specify EMC engineering standards for JPL programs. Monitor the engineering design of JPL hardware relative to EMC standards and travel to other Contractor locations to review compliance to EMC requirements.

Probabilistic Risk Assessment (PRA)

Must, as a minimum, have a Bachelor of Science degree in Physics, Mathematics, Science or Engineering, with a minimum of 12 years experience. Prefer a Doctorate degree in Mathematics or Statistics and at least 5 years experience in spacecraft systems and system interaction modeling. Experience with Fault Tree Analysis, ground based systems, systems engineering, space flight operations probability assessments and statistics is required.

Typical Duties: Support the development of Probabilistic Risk Assessment guidelines for JPL Flight Projects. Assist in the implementing of PRA on current JPL Flight Projects. Interact with NASA Headquarters in determining NASA's expectations for PRA to new NASA programs. Development, or support the development of PRA databases. Support JPL in the submission of proposals to NASA to obtain additional funding for PRA activities. Assist JPL in training JPL and contractor personnel of PRA methodology, techniques and guidelines.

[Remainder of Page Left Intentionally Blank]

**JOB CLASSIFICATION AND QUALIFICATION
GUIDELINES FOR CONTRACTOR PERSONNEL**

SENIOR ENGINEER

- (a) The following guidelines typify the background of personnel filling this position:

The general background experience of a Senior Engineer should include technical skills and responsibilities in: application of intensive and diversified knowledge of engineering principles and practices in broad areas of assignments and related fields; making decisions independently on engineering problems and methods and resolving important questions; use of advanced techniques and the modification or extension of theories, precedents and practices of own field and related disciplines; interfacing with engineering organizations to determine system requirements; preparing plans and schedules and coordinating and conducting important engineering projects from start to finish; assessing the feasibility and soundness of proposed engineering evaluation tests, products or equipment.

- (b) Specific requirements for the category of Senior Engineer will be called out in each Subcontract Work Order (SWO), and will as a minimum include one of the following disciplines:

Reliability/Availability/Maintainability (RAM)

Must, as a minimum, have a Bachelor of Science degree with equivalent course work in Electrical or Electronic Engineering, Physics, or an equivalent field, and at least 8 years experience in electronic systems reliability activities. Experience must include systems and subsystem level digital, analog, or RF design and analysis, such as PRA, Failure Modes, Effects and Criticality Analysis (FMECA), Fault Tree Analysis (FTA), reliability assessment, modeling, allocation, prediction trade-off studies, system evaluations

Typical duties: Perform or review reliability analyses; assess performance with respect to requirements; evaluate effectiveness of the failure reporting, analysis, and corrective action implementation; prepare reports; support logistic activities and reporting; support system and design teams; establish reliability models and utilize models for systems and subsystems analysis; use of computer aided engineering tools.

Reliability Engineering Analyst (REA)

Must, as a minimum, have a Bachelor of Science degree with equivalent course work in Electrical or Electronic Engineering, Physics, or an equivalent field, and at least 8 years experience in electronic systems reliability activities. Experience must include digital, analog, or RF design and analysis, such as Failure Modes, Effects and Criticality Analysis (FMECA), Worst Case Analysis (WCA), Electronic Parts Stress Analysis (PSA), reliability assessment, modeling, prediction trade off studies, system evaluations; failure reporting, analysis, and corrective action; use of computer aided engineering tools.

Typical duties: Perform or review reliability analyses; assess performance with respect to requirements; evaluate effectiveness of the failure reporting, analysis, and corrective action implementation; prepare reports; support logistic activities and reporting; support system and design teams; establish reliability models and utilize models for systems and subsystems analysis.

Thermal

Must, as a minimum, have a Bachelor of Science degree in Mechanical Engineering, Aeronautical Engineering or Physics. Must have at least 8 years of experience in thermal/climatic environment specification and testing and related disciplines. Must have some background in applicable military specifications related to environments and some capability in thermal design and analysis software such as Thermal Synthesizer System (TSS), Thermal Desktop including Fluint, Thermal Analyzer System (TAS), and Systems Improved Numerical Differential Analyzer (SINDA) or equivalent. Must have some background in reliability engineering.

Typical duties: Determine and specify thermal climatic environments and design and test criteria for spacecraft and ground electronics programs. Monitor thermal/climatic tests and evaluate results in terms of relevant reliability issues. Perform some thermal analyses and/or design review. Evaluate effectiveness of reliability and environmental testing programs. Participate in technical proposal generation. Interact extensively with project personnel.

Dynamics

Must, as a minimum, have a Bachelor of Science degree in Mechanical Engineering or Aeronautical Engineering and 8 years experience in dynamics environmental requirements and specifications. Ability to work system tasks and communicate with multiple interfaces is required. Dynamic Environmental testing, computer programming and dynamic analysis experience is desired.

Typical duties: Determine and specify vibration, acoustic, shock and climatic environments and design test criteria for flight projects and ground systems - both system and subsystem level.

Monitor Dynamics tests and evaluate test results and data. Interface with other Contractors and JPL test programmers.

Natural Space

Must, as a minimum, have a Bachelor of Science degree in Physics, with a minimum of 8 years experience. Prefer a Doctorate degree in Physics and at least 2 years experience in Space Environments Modeling. Computer programming experience is desired and ability to work system level tasks with good communication skills and multiple interfaces is required.

Typical duties: Determine and specify space environments and design and test criteria for both NASA and Military flight projects and ground systems - both system and subsystem level. Develop computer models of hardware cognizant engineers and test engineers.

Environmental Compliance

Must, as a minimum, have a Bachelor of Science degree in Safety or other engineering discipline, Physics, Chemistry, or Life Science and at least 8 years experience in one or more of the disciplines of: Accident Investigation, Work Area Inspection, Electrical Safety, Chemical Safety, Environmental Compliance, Hazardous Material Control and Removal, and Site Remediation. Must be familiar with applicable state and federal environmental laws and regulations.

Typical duties: Support the JPL Environmental Affairs Office or Safety Operations Section regarding hazardous materials, monitoring procedures for removal of asbestos and reviewing and implementing chemical safety procedures.

Probabilistic Risk Assessment (PRA)

Must, as a minimum, have a Bachelor of Science degree in Physics, Mathematics, Science or Engineering, with a minimum of 8 years experience. Prefer a Doctorate degree in Mathematics or Statistics and at least 2 years experience in spacecraft systems and system interaction modeling. Experience with Fault Tree Analysis, ground based systems, systems engineering, space flight operations probability assessments and statistics is required.

Typical Duties: Support the development of Probabilistic Risk Assessment guidelines for JPL Flight Projects. Assist in the implementing of PRA on current JPL Flight Projects. Interact with NASA Headquarters in determining NASA's expectations for PRA to new NASA programs. Development, or support the development of PRA databases. Support JPL in the submission of proposals to NASA to obtain additional funding for PRA activities. Assist JPL in training JPL and contractor personnel of PRA methodology, techniques and guidelines.

[Remainder of Page Left Intentionally Blank]

**JOB CLASSIFICATION AND QUALIFICATION
GUIDELINES FOR CONTRACTOR PERSONNEL**

ENGINEER

- (a) The following guidelines typify the background of personnel filling this position:

The general background experience for an Engineer must include the technical skills and responsibilities in: performing work which involves conventional engineering practice but may include a variety of complex features such as conflicting design coordination requirements, unsuitability of standard materials, and difficult coordination requirements; tasks requiring a broad knowledge or precedents in the specialty areas listed below and a good knowledge of principles and practices of related specialties; demonstrated ability to independently perform most assignments with instructions as to the general results expected with technical guidance provided on unusual or complex problems; demonstrated competence as an engineer in all conventional aspects of the subject matter for functional area of responsibility.

- (b) Specific requirements for the category of Engineer will be called out in each Subcontract Work Order (SWO), and will as a minimum include one of the following disciplines:

Reliability/Availability/Maintainability (RAM)

Must, as a minimum, have a Bachelor of Science degree in Electrical or Electronic Engineering or Physics with extensive course work in design and analysis. Must have at least 2 years experience overall in performing circuit analyses, including, Failure Modes, Effects and Criticality Analysis (FMECA), Fault Tree Analysis (FTA), reliability assessment, modeling; use of computer aided engineering tools.

Typical duties: Perform or review reliability analyses; assess performance with respect to requirements; develop criterion for reliability related tests and evaluations, review test reports; support system and design teams.

Reliability Engineering Analyst (REA)

Must, as a minimum, have a Bachelor of Science degree in Electrical or Electronic Engineering or Physics with extensive course work in design and analysis. Must have at least 2 years experience overall in performing circuit analyses, including Failure Modes, Effects and Criticality Analysis (FMECA), Worst Case Analysis (WCA), Electronic Parts Stress Analysis (PSA), modeling; use of computer aided engineering tools.

Typical duties: Perform or review reliability analyses; assess performance with respect to requirements; develop criterion for reliability related tests and evaluations, review test reports; support system and design teams.

Natural Space

Must be a U.S. citizen. Must as a minimum, have a Bachelor of Science in Physics and minimum of 2 years experience or Master of Science in Physics or equivalent as a minimum. Computer programming experience, particularly in the area of Database Manipulation and Modeling/Simulation, is desired. A background in or knowledge of Space Physics, Hydrodynamics/Fluid Mechanics and Plasma Physics is desirable.

Typical duties: Assist in analyzing data for the natural space environment modeling physics project.

Thermal

Must, as a minimum, have a Bachelor of Science degree in Mechanical Engineering, Aeronautical Engineering or Physics. Must have at least 2 years of experience in thermal/climatic environment specification and testing and related disciplines. Must have some background in applicable military specifications related to environments and some capability in thermal design and analysis software such as Thermal Synthesizer System (TSS), Thermal Desktop including Fluint, Thermal Analyzer System (TAS), and Systems Improved Numerical Differential Analyzer (SINDA) or equivalent. Must have some background in reliability engineering.

Typical duties: Determine and specify thermal climatic environments and design and test criteria for spacecraft and ground electronics programs. Monitor thermal/climatic tests and evaluate results in terms of relevant reliability issues. Perform some thermal analyses and/or design review. Evaluate effectiveness of reliability testing programs. Participate in technical proposal generation. Interact extensively with project personnel.

Dynamics

Must, as a minimum, have a Bachelor of Science degree in Mechanical Engineering, or Aeronautical Engineering and 2 years experience in dynamic environments specification and testing. The individual must have a minimum of 2 years experience in computer programming.

Typical duties: Support the implementation of the Vibroacoustic Payload Environmental Prediction Systems (VAPEPS) database management center at JPL. This duty includes: (1) Monitoring space payload acoustic tests, evaluation of data validity, and formatting of data for input to VAPEPS; (2) Modeling space payloads and prediction of payload dynamic environments using the VAPEPS code; (3) Providing consultation to VAPEPS users within the payload community.

Electro-Magnetic Compatibility (EMC)

Must, as a minimum, have a Bachelor of Science degree in Electrical Engineering or equivalent and two (2) or more years experience in Electromagnetic Compatibility (EMC) requirements testing and analysis.

Typical duties: Generate environmental estimates for EMC/magnetic considerations in support of JPL projects. Prepare test specifications, procedures and conduct EMC/magnetic testing and document results in test reports. Support projects in EMC/magnetic tasks as needed.

Environmental Compliance

Must have a Bachelor of Science degree in Safety or other engineering discipline, Physics, Chemistry or Life Science and at least 2 years experience in one or more of the disciplines of : Work Area Inspection, Chemical Safety, Environmental Compliance, Hazardous Material Control and Removal, and Site Remediation. Must be familiar with applicable environmental state and federal laws and regulations.

Typical duties: Will support the JPL Environmental Affairs Office or Safety Operations Section in reviewing and monitoring safety practices, especially regarding construction of facilities.

[Remainder of Page Left Intentionally Blank]

**JOB CLASSIFICATION AND QUALIFICATION
GUIDELINES FOR CONTRACTOR PERSONNEL**

Information Systems (IS) Specialist

- (a) The following guidelines typify the background of personnel filling this position:

The general background experience for a IS Specialist must include the technical skills and responsibilities in the areas of: Demonstrated capability to work independently on complex subroutines and on maintenance of in-place systems; assisting in the design, development and implementation of major system modules and programs on elements of large complex systems; participation in discussions with user personnel to review the purpose of the proposed program and information requirements or to solve problems using existing computer systems; writing programs from specifications and executing, testing and debugging; preparing flow charts, block diagrams, report layouts and detailed program designs using current design techniques and functional specifications for new or revised programs; documenting programs according to established standards; having demonstrated ability to receive instructions on specific assignment objectives, complex features and to develop possible solutions to unusual program problems.

- (b) Specific requirements for the category of IS Specialist will be called out in each Contract Work Order (CWO), and will include but not be limited to one of the following areas of expertise:

Must, as a minimum, have a Bachelor's degree and at least 10 years experience in computer programming, information systems, systems analysis, computer operations, program testing and documentation or experience with web-based site design and ability to synthesize technical information for reporting purposes. Experience with MS-Office (Windows/NT for PC or MAC) MS-Access, and/or Unix hardware and software is required.

Typical duties: Provide user support for PC, Macintosh, and SUN computer users. Help users with installation and use of computer hardware and software. Provide support for day to day maintenance of Sun servers. Diagnose problems and take corrective action as appropriate. Maintain and/or develop system utilities. Maintain and update Web pages and/or assist engineering staff in technical writing and problem failure reporting (P/FR) issues. Technical analysis and writing of flight project information for the Lessons Learned databases. Provide user consulting to JPL and subcontractor personnel.

[Remainder of Page Left Intentionally Blank]

JOB CLASSIFICATION AND QUALIFICATION
GUIDELINES FOR CONTRACTOR PERSONNEL

The following requirements identify the background of personnel filling Quality Assurance positions:

Quality Assurance Engineer

Must, as a minimum, have Bachelors degree in Manufacturing, Mechanical Engineering or Electrical Engineering or equivalent experience. Direct experience in quality assurance engineering required. Experience with space flight hardware and a broad technical knowledge in visual inspection and evaluation of high reliability electronic, electromechanical, or electro-optical equipment. Requires wide knowledge of materials and processes for space flight use as well as familiarity of configuration control/verification systems. Knowledge of ISO 9000 quality systems.

Typical Duties:

Interface with Project Managers, Project Element Managers, Task Managers, Mission Assurance Managers to develop appropriate quality assurance engineering requirements for JPL Space Projects. Generate workforce /cost plans, quality assurance procedures and instructions. Be familiar with inspection techniques and procedures, processing of failure reports and MRB's. Implement good communication skills. Perform supplier audits/evaluations. Perform workmanship inspections/evaluations.

Quality Assurance Inspector

Must, as a minimum, have 10 years experience in quality assurance inspection of high reliability electronic or mechanical equipment for space flight. Must be knowledgeable of ISO 9000 quality systems and familiar with configuration management, contamination control, data package reviews, integration and test processes governing the fabrication assembly, test and certification of space flight hardware. Good computer and communication skills and ability to work with multiple interfaces is required.

Typical Duties:

Support the fabrication JPL space flight electronics and cabling by performing inspections, documenting/creating nonconformance and manufacturing planning. Perform supplier source inspections and audits/evaluations.